DOCUMENT RESUME

ED 034 966 AL 001 868

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TITLE	An Experiment on the Recognition of Babbling.
INSTITUTION	California Univ., Berkeley. Language and Behavior Research Lab.
SPONS AGENCY	National Science Foundation, Washington, D.C.
REPORT NO	WP-15
PUB DATE	Aug 68
NOTE	8p.; Paper submitted at workshop on "Child, Language and Society," University of California, Berkeley, Summer, 1968
AVAILABLE FROM	Language-Behavior Research Laboratory, Institute of International Studies, University of California, Berkeley, California 94720
EDRS PRICE	EDRS Price MF-$0.25 HC-$0.50
DESCRIPTORS	*Auditory Discrimination, *Child Language, Cross Cultural Studies, Cultural Differences, *Language Development, Language Patterns, *Phonology, *Psycholinguistics

ABSTRACT

The purpose of this study was to discover: (1) whether or not adults can discriminate between the babbling of babies learning different languages, and (2) the approximate age at which discrimination is possible. There were two tests involved in the experiment. The identification test consisted of 20 babbling samples, each of which was 15 seconds long. Of the 18 different samples (two were repeated), six were from American babies, six from Russian babies, and six from Chinese babies. The babies ranged from 5 months, 29 days to 17 months, 9 days. The same-different test consisted of 24 pairs of babbling samples from the three linguistic environments. Half the samples were from 5-6 month old babies and the other half were from 16-17 month old babies. The items in each pair were matched for age, and the "different" items were matched for sex; all possible combinations, within these limitations, were presented in equal distribution. Results indicate that adults can neither identify the babbling of infants raised in different language communities as English or non-English up to the age of 17 months, nor judge whether two samples from infants at a given age are from the same or different language communities. However, subjects' decisions were not entirely random. (Authors/DO)

ED034966

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CHILDREN'S LANGUAGE STRUCTURE

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Working Paper No. 15
Language-Behavior Research Laboratory
April, 1969

The Language-Behavior Research Laboratory is funded by a grant from the Institute of International Studies, University of California, Berkeley, whose support is gratefully acknowledged.

"Language, Society and the Child" Summer 1968 was funded by the Social Science Research Council from a National Science Foundation grant.

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An Experiment on the Recognition of Babbling

August, 1968

UC Berkeley: Child, Language and Society

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AL 001 968

It is an accepted fact that infants babble, but the relationship between babbling and the acquisition of "true speech" remains unclear. Some psychologists and linguists maintain that the influence of the mother tongue is apparent early in an infant's linguistic development, while others feel that babbling and speech are two distinct phases of language acquisition which have little influence on one another.

In an effort to investigate this problem, Ruth Weir and Eleanor Maccoby collected babbling samples from babies being raised in different linguistic environments: Russian, Chinese, and American-English. After listening to a few of the samples, Weir reported (1966) that a six-and-one-half month old Chinese infant had a "very different" sound pattern from the Russian and American infants of the same age. She described the vocalizations of the Chinese baby as "usually monosyllabic and only vocalic with much tonal variation over individual vowels", while the babbling of the Russian and American babies showed "little pitch variation over individual syllables" and usually had "a CV (consonant-vowel) syllable, often reduplicated or repeated at intervals several times, with stress patterns occurring occasionally and intonation patterns usually over a number of syllables". (p. 156)

Weir's findings are supported by a study done in the Netherlands by Tervoort, a phonetician and teacher of the deaf, who reported (1966) that his Dutch college students could distinguish the babbling, from six months onward, of Dutch from non-Dutch children but could not distinguish among the non-Dutch. The languages involved in this study were all non-tonal. Tervoort later performed the same experiment with similar recordings in the United States and found that American students could distinguish between the English and non-English samples but not among the non-English.

Among those who disagree with the belief that the influence of the mother tongue is apparent during the prelinguistic stages of speech development is the linguist Roman Jakobson. In an article (1941) which has become a classic in the field of child language, he states that "the question of the prelanguage babbling period proves to be ... one of external phonetics, predominantly articulatory in nature".(p.27) It is significant, he asserts, that although an infant is capable of producing "an astonishing quantity and diversity of sound productions" during the babbling period, he suddenly loses his virtuosity with the onset of true speech (i.e. words). Jakobson demonstates that the process of the acquisition of phonemes is in fact universal, and can be predicted regardless of the variety of sounds produced in babbling or of the phonemic structure of the language which the infant is to learn.

Another who disagrees with findings of Weir and Tervoort is Nakazima who made a comparative study of the linguistic development of 10 infants, 6 of whom were Japanese, 4 were American. Recordings of the infants' vocalizations during the first year did not reveal any "meaningful differences" between the utterances of the Japanese and American babies, even in the 12th and 13th month, according to Nakazima and his researchers (1962).

The purpose of the present study was to discover: 1) whether or not adults can discriminate between the babbling of babies learning different languages; 2) the approximate age at which discrimination is possible.

Materials and procedures

There were two tests involved in this experiment -- an "identification" test (Test I) and a "same-different" test (Test II).

The identification test consisted of 20 babbling samples, each of which was 15 seconds long. The first two samples served as dummy items and were repeated at the end of the test (items #19 and #20), so there were 18 actual test items. Of the 18 samples, 6 were from American babies, 6 from Russian babies, and 6 from Chinese babies. The variables of age, sex and linguistic environment were controlled in the following manner:

Linguistic env.	Age A	B	C
Russian	boy	boy	boy
	girl	girl	girl
Chinese	boy	boy	boy
	girl	girl	girl
American	boy	boy	boy
	girl	girl	girl

Age A: 5 mos. 29 days - 7 mos. 14 days
Age B: 10 mos. 14 days - 11 mos. 0 days
Age C: 16 mos. 11 days - 17 mos. 9 days

The same-different test consisted of 24 pairs of babbling samples from infants from the same three linguistic environments: Russian, Chinese, and American-English. Half the samples were from 5 - 6 month old babies (Age A), and the other half were 16 - 17 month old babies (Age C). The items in each pair were matched for age, the "different" items were matched for sex; all possible combinations, within these limitations, were presented in equal distribution. The samples used in Test II were the same as those of Test I with a 5 second difference in length. Instead of being 15 seconds, the samples were cut to 10 seconds, so that each presentation (pair of samples) was a little over 20 seconds.

The material used as stimuli in both tests was drawn from babbling tapes collected by Ruth Weir and Eleanor Macoby. Selection of samples was according to the following criteria: a) clear recording, b) no parental or sibling speech, c) a minimum of "on-offs" from the voice-key recorder which was used in taping the infants, d) a stretch of at least 7 seconds of babbling, e) a certain virtuosity on the part of the subject, i.e. evidence that he was engaging in "vocal play".

There were two groups of subjects: Group I was composed of 36 professors and students who were taking part in a workshop in child language; Group II contained 13 subjects who were enrolled in a class in child language development.

The members of Group I were told that they were participating in an experiment on the recognition of babbling. In the identification test they were instructed to listen carefully to each babbling sample and then to decide whether the infant was from an English or non-English-speaking community. In the same-different test they were told that the pairs of babbling samples they would hear were from two different babies; in some cases these babies were from the same language communities, in other cases they were from different language communities. The subjects were asked to decide whether the infants were from the SAME or from DIFFERENT communities, and to mark the answers accordingly.

The instructions for Group II were identical with those for Group I with one modification: they were told that the samples they were about to hear were from infants being raised in three linguistic environments -- Chinese, Russian, and American-English.

Both groups were instructed to answer each question, even if they had to guess. After each test the subjects were asked to report the criteria they used in making their decisions.

Results and discussion

Charts I and II indicate that the instruction variable and any other group variables appear to be insignificant. Both groups show highly consistent behavior overall, particularly in regard to certain test items. Furthermore, it is evident that there was no discernible learning effect during the testing session. In fact, the two groups regitered 53 errors on the 2 dummy items at the beginning of the idetification test and 57 errors on the same 2 items at the end of the test.

Chart I
Identification Test

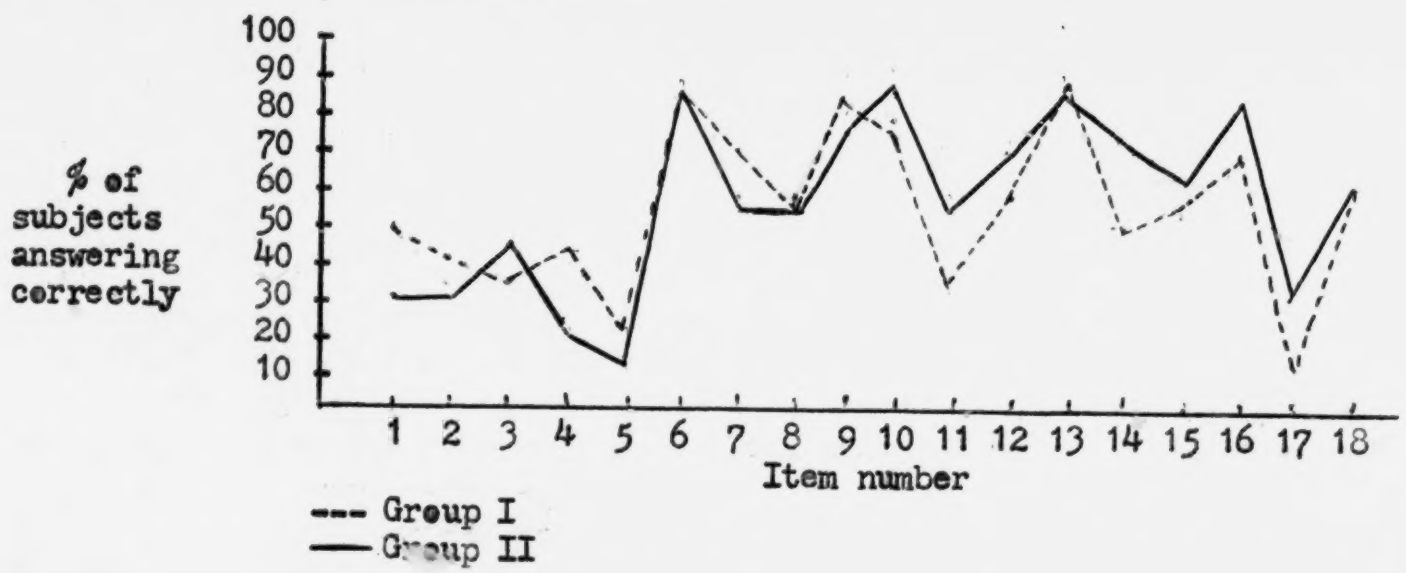
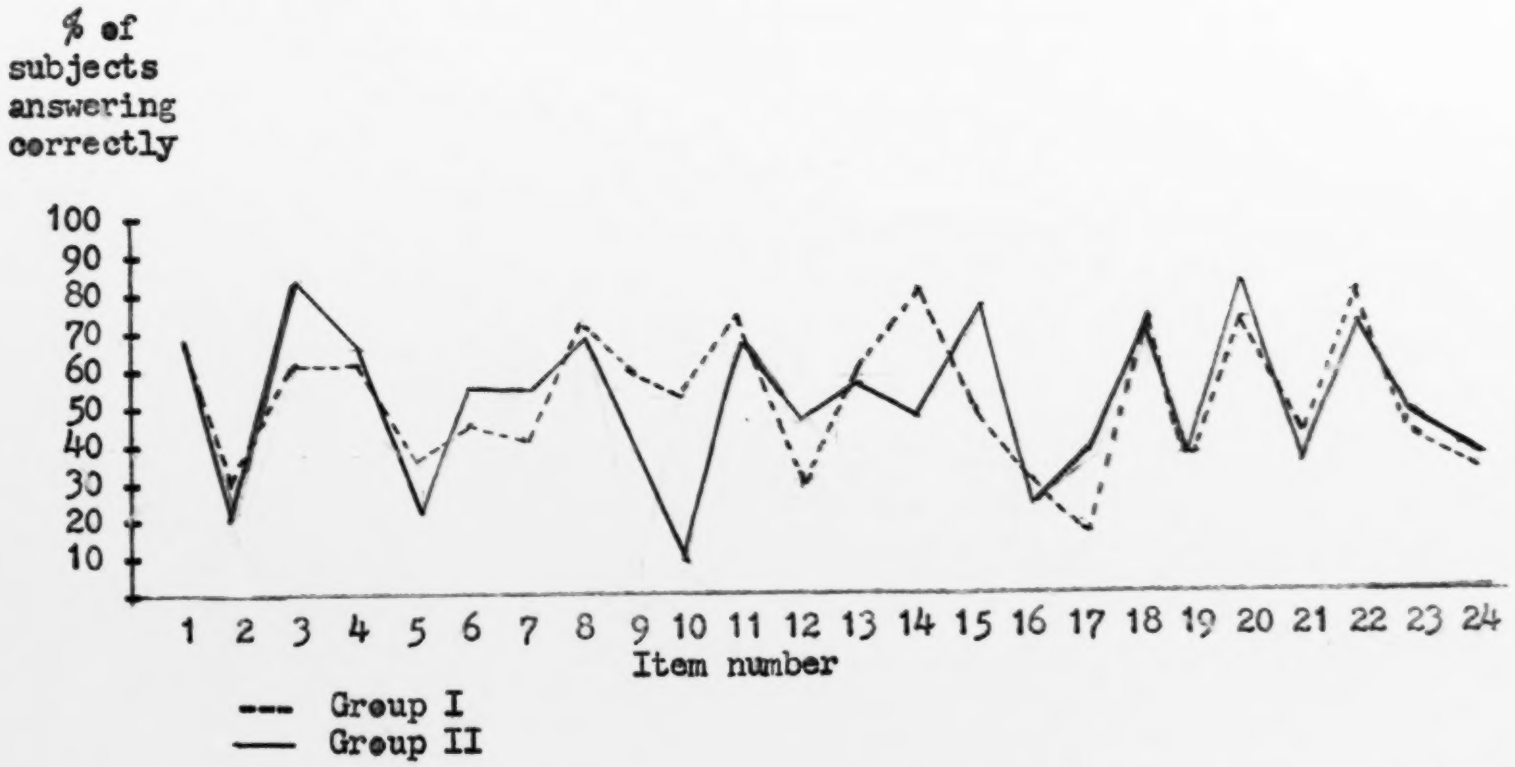


Chart II
Same/Different Test



The average number of errors per item divided by the total number of subjects yields a figure of .43 for the identification test and .49 for the same/different test. These figures are only a measure of general performance on the whole test, not on any specific item. In terms of general performance then, the results are close to .50, the figure which would be obtained by random guessing -- in neither test are the results significantly different from chance.

Table I
Identification Test
Total errors, by language

English	107	possible errors:
Russian	134	294
Chinese	141	

Table II
Identification Test
Total errors, by age

Age A	120
Age B	102
Age C	160

An examination of the results of the identification test (Tables I and II) suggests that both age and language have significant effects on the accuracy of subjects' decisions. The higher proportion of correct answers on samples which were in fact English may be predicted by certain theories, but the increase in errors at Age C (16-17 mos.) is a surprise. However, more detailed analysis indicates that both these effects may be attributed to the test design. a) The effect apparent in Table I stems from the imbalanced design of the test -- since subjects tended to place an equal number of responses in the English and non-English columns, and since there were fewer items in the English column (6) than in the non-English column (12), the chances of answering the English items correctly is higher than chance. Thus most of the differences between the number of errors on the English items as compared with the Russian and Chinese items can be accounted for. b) The difficulty with the Age C items (Table II) seems to stem from the presence of an articulated CVCV syllable pattern in all of the non-English samples. This pattern was mistakenly identified as coming from children raised in English-speaking communities.

Table IV
Same/Different Test
Total errors by age on Same and Different pairs

	Same	Different
Age A	102	183
Age C	162	116

Table V
Same/Different Test
Total errors by language involved in any combination

English	279
Russian	309
Chinese	284

Table VI
Same/Different Test
Total errors in <u>same</u> pairs

English/English	95
Russian/Russian	107
Chinese/Chinese	72

The results of the same/different test show that subjects had no preference for <u>Same</u> or <u>Different</u> as responses in general (Table IV). There was, however, an interesting tendency to judge younger infants as <u>different</u> and older infants as <u>same</u>, contrary to what would be predicted by a theory of increased differentiation with age. Age was

not found to be a significant factor in this test. In regards to the language variable, (Tables V and VI) it can be seen that the greatest number of errors were made when the combination involved Russian, and that Chinese infants were most easily recognized as coming from the same language community.

Conclusions

This experiment indicates that adults can neither identify babbling infants raised in different language communities as English or non-English up to the age of 17 months, nor judge whether two samples from infants at a given age (5 - 6 mos. or 16 - 17 mos.) are from the same or different language communities.

However, subjects' decisions were not entirely random, as shown by the marked consistency of both groups in performing well or poorly on particular items. The cues being used to judge such items are not known. After listening to the items with a high degree of agreement, we had several subjective impressions. It appeared that subjects seemed to judge samples with the following characteristics as English:

a) CVCV structure where the Cs were clearly articulated
b) lack of trills and other strange effects"
c) characteristic English intonation patterns (e.g. 2-3-1)
d) lack of "tonal" pitch modulations
e) presence of laughter

Although the results indicate that adults are unable to discriminate between the babbling of infants from different linguistic environments, this does not mean that we think there are no differences in the vocalizations of such infants. Perhaps with training the same subjects would succeed at the task; perhaps the results would have been different if the samples had been longer (i.e. 45 - 60, secs. rather than 10 - 15 secs). Our study simply questions the findings of Weir and Tervoort, it makes no attempt to resolve the initial problem: what is the nature of the relationship between an infant's babbling and the language he is going to acquire.

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